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FISCAL DECENTRALIZATION AND TAX COMPETITION IN THE EU MEMBER STATES

Abstract. *The paper tries to find the connection between fiscal decentralization and tax competition in the European Union, for the 1995-2008 periods. The main hypothesis is that if the degree of fiscal decentralization augments, then the intensity of tax competition increases. For this purpose we used the panel cointegration tests and Two Stage Least Squares GMM method to estimate the existence and intensity of the relationship between those two variables.*

Key words*: tax competition, fiscal decentralization, relationship, impact, effects, model.*

JEL Classification: **H77, H87.**

1. Introduction

In the last decade the EU Member States have actively engaged in tax competition to attract mobile capital by reducing the statutory corporate income taxes. In this setting of reductions in tax rates, there is a more aggressive tax competition from new Member States in order to attract foreign direct investments, especially since 2000. Moreover, considering the broad definition of tax competition, i.e. any form of non coordination of tax policies, there is a tendency of increasing differences between the EU Member States taxation systems. Basically, since the EU is in an advanced stage of harmonization of indirect taxes, tax competition is more noticeable on the direct taxation.

At the same time, there has been a widespread process of fiscal decentralization in the Member States, reflected by the rising share of sub national governments expenditure in total public expenditure.

In this setting, there is a growing body of literature which proposes the hypothesis of a possible correlation between the degree of fiscal decentralization and tax competition among

EU Member States (example 2-3). Since usually the political forces are considered the main determinants of decentralization, the fiscal decentralization is viewed as an exogenous variable. In the economic integration process two tendencies are likely to occur: on the one hand, the role of national governments reduces as the role of sub-national authorities' increases, and, on the other hand, the mobility of individuals and capital increases. Thus, due to the rising mobility of tax bases, public authorities are forced to reduce tax rates to avoid diminishing their tax base. Thus, the objective of this paper is to examine recent empirical evidences that are presumable able to support this hypothesis.
Several techniques are applied in order to evaluate the inter-linkage between tax competition among EU Member States and the descriptors of fiscal decentralization. A *Two Stage Least Squares GMM* method is used to estimate the sensitivity coefficients. Second, a Johansen cointegration test is ran between expenditure decentralization and revenue decentralization in order to provide a more detailed explanation for the involved mechanisms. Such an approach seeks to count for the adjustment process at the level of local jurisdictions with potential impact on factor mobility in a framework of second generation fiscal federalism (Oates, 2005).

2. Theoretical fundaments

The relationship between fiscal decentralization and tax competition is debatable thing, regarding intensity level and direction. The main idea of Tiebout (1956), that the most important benefit of multilevel government system is the ability of mobile households to "vote with their feet", represent the fundament of modern tax competition literature. Several years after, Oates (1985) examined the effects of tax competition on the size of government by using cross-section data on expenditure decentralization, but found no conclusive evidence to support the *Leviathan taming hypothesis*.
Sato (2003) finds that rent-seeking activities account for political distortions which may be mitigated in the process of fiscal decentralization, while tax competition results in economic distortions associated with decentralization. For Janeba and Wilson (2003) a country's decentralization level serves as a strategic tool through its influence on the mix of horizontal and vertical externalities that exist under tax competition. In contrast to standard tax competition models, decentralizing the provision of public goods may be welfare-enhancing. Rodden (2004) considers that there are good reasons to believe that decentralization, if it facilitates intergovernmental tax competition, will lead to a smaller public sector.
Keen and Kotsogiannis (2004) argue that intensified lower-level tax competition - in the form of an increase in the number of lower-level jurisdictions - is sure to reduce welfare, but this is not because it makes excessively low state taxes even lower; rather, it is welfare-reducing either for that reason or because it makes excessively high state taxes even higher.
Leruth (2008), studying decentralization and tax competition, considers two important things:
(a) The empirical evidence shows that vertical tax rate competition has remained limited (although it exists);
(b) As sub-national governments took over more responsibilities, the tax base has tended to remain stable (although an immobile base can eventually become mobile).
Finally, we agree the idea of Brülhart and Jametti (2008) that the jurisdictional fragmentation of 'Oates' is often found to be associated with lower tax rates.

In this context, has been difficult to read a clear interpretation into such results, because a negative partial correlation between fragmentation and tax rates could represent either *Leviathan taming* via horizontal tax competition, or a race to the bottom away from the socially optimal tax rates.

3. Methodological framework

Based on the mentioned results, it is possible to formulate the following hypotheses:

H: Increasing the degree of fiscal decentralization in the EU Member States can exert (at least in an initial "adjustment" phase) an intensification of tax competition.

To evaluate the impact of financial decentralization on tax competition will use a model of the following form:

$$Y_{it} = \alpha + X'_{it}\,\beta_{it} + \delta_i + \gamma_t + \varepsilon_{it} \tag{1}$$

where:

Y_{it} - dependent variable;

X'_{it} - independent variable;

β_{it} - independent variable coefficient;

α - global constant;

δ_i, γ_t - cross-section and period specific effects (random or fixed);

ε_{it} - disturbance term.

The independent variable used is the degree of financial decentralization, which we expressed in two alternatives:

a) The share of sub-national expenditure in total public expenditure, calculated as the total sub central expenditure less the grants to other levels of government divided by the total general government expenditure, less the intergovernmental grants. Despite its limitations, this indicator of decentralization remains the most frequently used in literature because it offers two important advantages, namely, availability of data from statistic databases and comparability of results between countries (Ebel and Yilmaz, 2002).

b) The share of sub-national own revenue in total government revenue. Own revenues include revenues from taxes and other non-tax revenue, less grants from other levels of government. Unlike the first indicator, which tends to overestimate the degree of decentralization, this one indicates local authorities' capacity to mobilize resources.

We have calculated the values for these indicators based on Eurostat, *Government Finance Statistics 2009* for the period 1995-2008. For two new member states, Bulgaria and Lithuania, the data regarding the mobilization and allocation of

financial resources between levels of government are missing for the period 1995-1997, respectively, from 1995 to 1999. For this reason, we decided to eliminate these two states in order to preserve a larger number of observations.

To capture the various forms of tax competition, we constructed three indicators.

Tax competition in the *narrow sense* (i.e. horizontal tax competition in order to attract capital) can be captured by the differences in statutory tax rates on corporate income, as this type of tax is most relevant in this respect. Thus, we calculated for each of the 27 Member States the sum of the absolute variation between its tax rate and the tax rates in the other 26 countries. Data source is the Eurostat report *Taxation Trends in the European Union, 2009 edition*.

For tax competition in a *broad sense*, i.e. any form of non-cooperative tax setting by independent governments (Wilson and Wildasin, 2004), we used two indicators, the share of direct taxes in total tax revenue and global tax burden, calculated as the ratio of total tax revenue (excluding social contributions) on GDP. These indicators were also calculated as the sum of the absolute differences between the values recorded in each state and the other states. Data were extracted from the databases of Eurostat, *Government Finance Statistics, 2009*.

The methodology for estimating this model requires the following steps:

- Testing if the explanatory variables are non stationary, aiming to estimate the extent to which these processes can be described as type I(1), unit-root processes (See Table 1 in Appendix);
- Appling the panel cointegration test in order to identify the functional connections existing between the various explanatory variables. More specifically, the objective of this stage is to determine if such a cointegration relationship exists, in order to establish whether it is possible that the explanatory variables can be simultaneously considered. However, such a technique can, at least partially, attenuate the inconsistency of fiscal decentralization index which is described by the expenditure component. Usually, the field literature deals with this component, excepting the revenue element;
- Finally, we estimated a *Generalized Method of Moments / Dynamic Panel Data* (GMM) model using the framework proposed by Arellano and Bond (1991, 1995) and Blundell and Bond (1998, 2000). All the lagged values of the dependent and explanatory variables are considered as instrumental variables and the *White cross-section* technique is involved to compute the robust covariance weights. The values of the Sargan test of over-identifying restrictions reported in Table 1 suggest that the instrumental variables are correctly chosen.

As shown in Table 1. from Appendix, according with these tests, both the expenditures as well as the revenues series can be seen as *I(1)* processes (mean stationary on first order differences). Thus, it is possible to test the cointegration of these two variables.

However, the results of cointegration tests reported in Table 2. from Appendix are mix ones. For instance, the Pedroni tests (with the exception of *Panel v-Statistic*) are supporting the common AR coefficients (within-dimension) hypothesis. Kao tests assign a probability of 27% of no cointegration null and Fisher statistic from the

Johansen Fisher panel cointegration tests cannot be used to find a cointegration relationship between these variables.

Table 1

	Δ Statutory corporate income tax rate	Δ Global tax burden	Δ Direct taxes share in total taxation
Expenditure decentralization	1.25*** (0.104)	-0.20 (0.201)	0.73 (0.482)
Revenue decentralization	0.64*** (0.236)	0.24 (0.222)	-1.35 (2.065)
Sargan test of over-identifying restrictions	$\chi(25.10,23)=0.34$	$\chi(23.70,23)=0.42$	$\chi(24.40,23)=0.38$

*, **,*** *significant at 1%, 5% and 10%*

The model's results indicate a strong correlation between the degree of decentralization and the indicators that capture tax competition. Thus, increased decentralization, expressed both through sub-central expenditure ratio and through sub-central own revenue ratio on the total expenditure and, respectively, total revenue has a significant positive impact on growth of differences in statutory corporate income taxes in the EU Member States. Therefore, we can state that increasing the degree of fiscal decentralization in the Member States resulted in an intensification of horizontal tax competition.
Still, the indicators of the fiscal decentralization degree do not seem to have a significant impact on the differences between the structures of taxation in Member States. Also, the model parameters indicate that fiscal decentralization has no significant impact on differences in global tax burden. Thus, non coordination of tax policies, as evidenced by differences between Member States total taxes share in GDP, does not appear to be influenced by fiscal decentralization process.

Conclusions and further research

In conclusion, there are strong arguments for admittance of the hypothesis, that increasing fiscal decentralization can determine an increased tax competition between Member States. This result is as expected, since in the context of continuing economic integration in the European Union the obstacles to free movement have been gradually removed and, hence, national governments are forced to reduce tax rates, since the Old Member States do not want to face a reduction in their tax base as the New Member States aggressively compete to attract foreign direct investments.

Increased mobility of the tax base is found, especially for capital, and less for labor, whereas individuals in the European Union mobility is restricted by ethnic, linguistic, cultural or religious barriers. The results obtained are, thus, consistent with the theory of fiscal federalism that argues that increasing fiscal decentralization will lead to a higher tax base mobility, at least partially, as the effect of fiscal policies.
I should be noticed that the considered variables (revenue and expenditure decentralization) are adjusted in the framework of the Stability and Growth Pact. This leads to the existence of an upper bound for their existence as it is this derived from the multi-annual objectives of the Pact. Thus, it can be considered that there are certain limits for the extent of tax competition at least it is measured by differences in statutory corporate income tax, differences in global tax burden and differences in the structure of taxation. As a consequence, a prudent interpretation of our results is a one according to which there is a connection between fiscal decentralization and the long run tendency of tax competition. The short run deviations should be seen as associated to the requirement of current corrections of fiscal policies.

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Appendix

Table 1. Pool unit root tests for public expenditures and revenues

A) Expenditures

A.1.) Level

Sample: 1995 2008
Exogenous variables: Individual effects, individual linear trends
User specified lags at: 1
Andrews bandwidth selection using Quadratic Spectral kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	1.10	0.86	25	300
Breitung t-stat	-1.04	0.15	25	275
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-0.43	0.3334	25	300
ADF - Fisher Chi-square	60.09	0.1552	25	300
PP - Fisher Chi-square	60.42	0.1484	25	300

A.2.) First order difference

Sample: 1995 2008
Exogenous variables: Individual effects, individual linear trends
User specified lags at: 1
Andrews bandwidth selection using Quadratic Spectral kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-2.11	0.01	25	275
Breitung t-stat	-4.08	0.00	25	250
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-4.20	0.00	25	300
ADF - Fisher Chi-square	101.19	0.00	25	300
PP - Fisher Chi-square	144.81	0.00	25	300

B) Revenues

B.1.) Level

Sample: 1995 2008
Exogenous variables: Individual effects, individual linear trends
User specified lags at: 1
Andrews bandwidth selection using Quadratic Spectral kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-7.07	0.00	25	319
Breitung t-stat	0.35	0.63	25	294
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	0.88	0.81	25	319
ADF - Fisher Chi-square	47.50	0.57	25	319
PP - Fisher Chi-square	137.47	0.00	25	325

B.2.) First order difference

Sample: 1995 2008
Exogenous variables: Individual effects, individual linear trends
User specified lags at: 1
Andrews bandwidth selection using Quadratic Spectral kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-14.08	0.00	25	294
Breitung t-stat	-3.48	0.00	25	269
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.47	0.00	25	294
ADF - Fisher Chi-square	115.76	0.00	25	294
PP - Fisher Chi-square	321.55	0.00	25	300

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Table 2. Panel cointegration tests

A) Pedroni Residual Cointegration Test

Cross-sections included: 16 (9 dropped)
Null Hypothesis: No cointegration
Trend assumption: No deterministic intercept or trend
Use d.f. corrected Dickey-Fuller residual variances
Automatic lag length selection based on HQIC with a max lag of 2
Newey-West automatic bandwidth selection and Bartlett kernel
Alternative hypothesis: *common AR coefs. (within-dimension*)

	Statistic	**Prob.**	**Weighted Statistic**	**Prob.**
Panel v-Statistic	-1.14	0.87	-1.99	0.98
Panel rho-Statistic	-3.36	0.00	-2.97	0.00
Panel PP-Statistic	-4.48	0.00	-3.93	0.00
Panel ADF-Statistic	-3.83	0.00	-2.30	0.01

Alternative hypothesis: *individual AR coefs. (between-dimension)*

	Statistic	Prob.
Group rho-Statistic	0.18	0.57
Group PP-Statistic	-4.37	0.00
Group ADF-Statistic	-4.20	0.00

B) *Kao Residual Cointegration Test*

Included observations: 375
Null Hypothesis: No cointegration
Trend assumption: No deterministic trend
Automatic lag length selection based on HQIC with a max lag of 2
Newey-West automatic bandwidth selection and Bartlett kernel

	t-Statistic	**Prob.**
ADF	0.60714	0.2719
Residual variance	4.863924	
HAC variance	3.940689	

C) *Johansen Fisher Panel Cointegration*

Unrestricted Cointegration Rank Test (Trace and Maximum Eigenvalue)

Hypothesized No. of CE(s)	**Fisher Stat.* (from trace test)**	**Prob.**	**Fisher Stat.* (from max-eigen test)**	**Prob.**
None	141.1	0.0000	123.5	0.0000
At most 1	86.93	0.0001	86.93	0.0001

* Probabilities are computed using asymptotic Chi-square distribution.